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A Note on the Toxicity of Sea Water to Bovines.

By G. W. DUNKIN, M.R.C.V.S., Canterbury.

(Presented to the South Eastern Veterinary Association.)

Mr. President and Gentlemen,

Perhaps a short explanation of the circumstances which brought this subject to my notice will help to explain its selection, and, in addition, lend interest to my after-remarks.

I was approached some time ago by the legal advisers of two farmers, who were proposing to claim against a public body for loss of cattle and sheep alleged to be due to poisoning by sea water. I was retained in my professional capacity for the claimants.

Failure to comply with certain rules which apply to intending litigants against public bodies resulted in the case falling to the ground. This fact, however, does not lessen our interest in a subject which on first sight appeared to me to be somewhat simple, but which on looking more deeply into it brought up more difficulties than one would expect.

And first let me say that I was against an action being taken, my view being that death from this cause would firstly be impossible to prove; this was rendered even more doubtful in my mind by the actual circumstances of the particular case. This is only my view, which is not based on any personal experience, but on what I think and on what I have read in veterinary history (and I have referred back to literature written in 1856).

So much for the circumstances which led me to select this as a suitable subject for your consideration; now for my reasons likewise.

I believe I may be considered a normal country practitioner, and as such I admit that had this case come to Court I should have found myself in a more or less difficult position on cross-examination.

Any veterinary surgeon who practices in East Kent might be called upon to give an opinion on this condition at any time, and it appears to me that very little is known about the subject, and, therefore, I am hoping that discussion will assist in removing some considerable doubts I have upon it.

The histories of the cases under consideration were, as far as I can gather (for no veterinary surgeon was called in), general *malaise* at the outset, followed by gradual loss of appetite, with consequent emaciation and diarrhœa (which latter symptom was very profuse for the last few weeks of life), then death. These symptoms were observed in cattle. In the sheep the emaciation was not observed so much, but the diarrhœa was very constant.

The conditions under which the animals were living were as follows. They were turned out in marshes bordering on the sea; the marshes being separated from the sea by the sea wall. Owing to the drought which visited us last summer, the sea wall developed cracks in its structure through which the sea percolated, so making the cracks larger, the sea thus entering the marshes and running into the depleted dykes.

It is suggested by the owners that until this happened no deaths occurred, and no illness was observed in any of the animals.

The questions which would naturally arise at the trial and which would have to be answered by the veterinary experts would be: (1) Would cattle and sheep ordinarily drink sea water? (2) If not, would they drink it under circumstances which obtained last summer, when no other water was available? and (3) If they did, would they drink sufficient to harm them, and how much would be necessary to bring this about? Before the case was shelved these were some of the questions which I endeavoured to answer to my satisfaction, and, I admit, with no great success.

The subject is of supreme importance to all veterinarians, but particularly to those who practice in a district bordering on the sea, and, I repeat, very little is known about it.

In order to obtain the result which it is my desire to get, namely a good discussion, I think if I give you my opinion and observations on the subject, it might be more effective than if I just asked you to discuss it forthwith.

It is a matter of great regret that no veterinary surgeon was called in when the animals were ailing, and I was, as far as I know, the only one who was asked to make a *post-mortem* examination on a selected case. One of the owners told me he had a cow which would certainly die, and that it was shewing the same symptoms as others which had died, and compensation for which loss he was claiming.

I made a very careful *post-mortem* and found the cause of the illness to be Johne's Disease. It was, indeed a very typical case. It showed the usual thickening and cerebellar-like wrinklings which we are told is such a diagnostic symptom and which extended all along the small gut and the colon.

All other organs were, to my mind, normal.

As regards the total number of cattle and sheep which died, I believe the numbers were six and eighteen respectively. I do not suggest that they all died of

Johne's Disease, but I say that it is highly probable that some of them did.

So much for the cause of death of the only animal which I was permitted to see and for my suggestions as to the cause of death in the others.

My arguments against death being due to salt poisoning are as follows :—

Whilst agreeing that cattle or sheep will drink sea water if nothing else is available, I am of opinion that a very considerable amount would have to be imbibed to give rise to fatal poisoning. First let us note the chemical analysis of ordinary sea water. I am told by a public analyst that its ordinary constituents are as follows, *i.e.*, in so far as we are affected : In 10 gallons of ocean sea water the total solids amount to 3·5lbs. Of these, NaCl totals 2·7lbs., $MgCl_2$, 4lbs., odd and ends, ·4lbs.

Before going further it is necessary to study the dilution of salt as it occurs in the sea and whether it is sufficiently diluted or not. Lander quotes (*a*) that 27lbs. of salt were dissolved in water and given to seven cattle with fatal results. Unfortunately, he does not state how much water was taken to dissolve this amount of salt.

Lander further tells us (*b*) that " it is stated that from 4·5lb. to 7lb. may prove fatal to cattle—from 2lb. to 4·5lb. to the horse, and from 4oz. to 8oz. to the sheep and pig."

(*c*) Further, he states that a pig had five daily doses of 1 ounce, six of 2 ounces, and six of 3 ounces consecutively. Although the three-ounce doses were not eaten readily, no abnormal effects were observed. This experiment is to my mind interesting, in so far as the pig is perhaps the most susceptible of all farm animals other than the fowl.

As against that I have personally experienced fatal poisoning of a large number of pigs from drinking swill composed mostly of salt water obtained from that in which salt beef had been boiled. Suffran (*d*) states that thirteen out of fifteen fowls died after eating a salted potato mash and symptoms set in twelve hours after eating the mash.

So there is no doubt that under certain circumstances sodium chloride is poisonous and fatally so in certain cases.

So much for the evidence I have been able to compile as regards the possibility of cattle and sheep being poisoned by salt water. I have been fortunate in being able to obtain some evidence to the contrary.

I am told that in India and other Eastern countries where they abound, that it is a saying among the natives that elephants come to the sea or a salt lake to die. In other words they are under the impression that elephants, after drinking sea water, do actually die from its effects.

On the other hand big game hunters tell me that it is only when they are very ill from some malady or other that they visit salt lake districts, and that there are occasions when they improve sufficiently to return to their jungle home.

A big game hunter, whom I know well, tells me that the place to find one's quarry above all others, is at or near a salt lake. I have no doubt that this applies to the larger carnivorous animals.

Again, there is in Brittany a special breed of sheep which graze on the marshes bordering on the sea, and no ill effects are observed from this cause. Actually, they thrive on this pasture and salt water, and when killed their flesh has a distinctly salt flavour, the mutton being known as "*mouton malais.*" This dish, I am informed, is "*recherche*" on the Continent. and costs a good deal more than ordinary mutton.

This, gentlemen, is all the evidence I have been able to obtain in the short time which I had at my disposal. The time was short for the reason already explained, that I was anxious not to be guilty of contempt of Court in bringing this subject to your notice if a case were possible.

In conclusion, I would again reiterate my own opinion that, except under exceptional circumstances, sea water is not fatally poisonous to cattle or sheep. I would add that there is absolutely no previous history—except the sole case quoted, in which salt water was actually given to the cattle (they did not drink it of their own accord)—of such being probable.

I am guilty of some amount of selfishness in bringing this subject to your notice, for I hope to gain some useful knowledge on this important question. On the other hand, I hope this short note will have been instrumental in demonstrating how easily we can pass over a comparatively simple subject, but which, when looked into thoroughly, presents difficulties of which we were totally ignorant.

References.

(*a*) Abstract— *Veterinarian*, 1870, p. 635.
(*b*) Lander— *Veterinary Toxicology*, p. 80.
(*c*) Lander— *Veterinary Toxicology*, p. 80.
(*d*) Suffran— *Journal of Comparative Pathology*, 1910, p. 71.

Discussion.

Mr. Ebbetts said he remembered nearly thirty years ago being called to some bullocks in the Isle of Grain, during a very dry period. On arrival he found that one of the animals, after drinking a considerable quantity of water from one of the dykes, immediately went down and was unable to rise. As it was a good fat beast it was slaughtered. The remaining animals were removed, and there was no further trouble. He attributed the illness of the animal to drinking salt water.

The President said the paper read by Major Dunkin was of considerable interest, especially to those members practising in districts where there was a possibility of animals obtaining salt water. He happened to have had experience of some cases of this kind in 1918. He was asked to attend some beasts near Sandwich, belonging to one of his clients, at a place which was in close proximity to sea water. the ditches in these particular marshes being filled by sea water let in by opening the sluices at suitable times.

On arrival and examination he found that one bullock had already died, and he believed been taken

to the slaughterhouse; and two others were almost in a state of collapse. For some little time he was at a loss to understand the cause, as the dykes had been kept dry, the authorities being fearful of malaria, but he found there was a considerable number of military stationed in the district, some of whom had opened the sluices without regard to time or tide and let in the sea-water. The cattle had been able to get at this water and he made up his mind that the animals were suffering from salt poisoning.

He had two beasts removed to the slaughterhouse and slaughtered at once and made a *post-mortem* afterwards. He communicated with the inspector of meat in the district and arranged to meet him there and they both examined the carcases. The first stomach in both cases was tremendously engorged with fluid as well as food (the fourth was also inflamed), and some of the contents of the stomachs were sent to the County analyst for analysis. When he saw the carcases later the flesh was in a beautiful state—just as one would find in an ordinarily slaughtered animal—and in regard to both animals the inspector and himself were able to agree that the carcases were absolutely fit for human food. One other beast had to be slaughtered a little later. The rest were shut away from any possibility of obtaining any more sea water and went on satisfactorily.

The result of the analysis showed an admixture of forty-five per cent. of sea water and an equivalent of 510 grains of combined chlorine per gallon.

He agreed with Major Dunkin as to the possibility that poisoning might be due to some other constituent than the salt of the sea water.

The owner duly brought forward a claim and was still hoping for compensation from the military authorities, but he felt doubtful as to whether he would be successful.

Mr. MORGAN stated that he was called in to see an animal which was *supposed* to have died through drinking salt water. He found intense inflammation of the stomach and intestines and all he could say was that the animal's death might have been due to its taking the salt water.

The SECRETARY, in thanking Major Dunkin for his exceedingly interesting paper, said he had never met with cases if the kind described, but he thought both the paper and discussion had been of more than ordinary interest. (Hear, hear.)

Major DUNKIN, in reply, stated he was more than ever convinced that if an animal's death was caused by imbibing a large quantity of sea water, other constituents of the sea water had something to do with it besides the salt. It seemed to him apparent that their knowledge was very limited of this particular subject, and it was very awkward when they were called upon to give an opinion of something about which they knew nothing.

He was still convinced that it required a great deal of salt water to kill a bullock, and if a bullock did drink salt water and subsequently died, he was of opinion that its death was largely due to some other constituent than sea water, which the analyst had either not discovered or could not discover; it might be something of bacterial origin.

Animal Husbandry in the Veterinary Curriculum.

By G. A. DICK, Professor of Animal Industry, Veterinary School, University of Pennsylvania.

Animal husbandry in the veterinary curriculum is a subject that deserves much more attention than it has received. The more one studies this subject the more its importance will be appreciated.

There is a general belief among our leading veterinarians and livestock men that the veterinarian of the future will be a broad-minded animal specialist. He will be what Dr. Leonard Pearson was pleased to term an "animal engineer." He will not only be well trained in the subjects of veterinary medicine, but he will also be a trained animal husbandman. Such a man would be an important asset to any farming community and should occupy a place of considerable importance and responsibility. He would be able to speak to the stockman in his own language and render him valuable service in handling livestock problems. If he is not capable of doing this he will often find himself in disagreeable situations.

That was the experience of a veterinarian known to the writer. When this man graduated from a veterinary school, although he had had the average farm boy's experience, he found that his knowledge was too limited to be of value in the promotion of agriculture. He was located in a section where all the farm animals were scrubs or grades and the people were anxious for someone to tell them how to improve their livestock and practice better farm methods. At first he missed many excellent opportunities for helping these people. He knew but little about the production of horses, therefore, when a group of his prospective clients wanted to buy a purebred stallion to use in the community, he had no clear idea of what type or breed to recommend, where the most desirable animal could be purchased, or what price should be paid for it. A firm of importers sent a representative to his community with a horse to sell. The veterinarian was unable to judge whether the animal had the proper quality, conformation, etc. The horse was sold for much more than it was worth to this group of enthusiastic but credulous farmers who were willing to put up the money. They, like most companies of this sort, lost all they put in it, and the horse industry in that vicinity was given a serious blow from which it has never recovered.

Later, certain farmers in his territory desired to improve their stock of dairy cows. They made a serious mistake because the veterinarian was not conversant with the principles of breeding. He encouraged them to buy heifers which were to be bred to a close relative. It happened that some unfavourable genetic factor in the make-up of these animals was brought to the surface by inbreeding. This resulted in a complete failure and gave the purebred a bad reputation. A man familiar with the principles of breeding would never have made such a mistake. He would realise that the constructive breeder would consider such a mating a hazardous experiment. In both cases an excellent opportunity was offered this veterinarian to have rendered his clientele valuable services

which might have resulted in a permanent improvement of the livestock in his community and at the same time establish for himself an enviable reputation.

The modern veterinarian is expected to have the right kind of knowledge on such subjects. Too many are deficient in the principles of breeding, feeding, judging, etc. We should have expert knowledge of the things mentioned and be acquainted with the breed history of our domesticated animals and the best families in each breed. We should also know the types and breed characteristics. A man once said, "If a veterinarian should look over the fence and remark that a certain Poland China sow was a pretty good Berkshire, it would probably shake his client's confidence in his ability as an animal physician."

In addition one should know the principles of horsemanship, have a knowledge of the various bits and their functions, and of saddles, seats and harness; how to dress animals for the show-ring and how to show them. Such subjects as soils and maintenance of soil fertility, care, management and feeding of livestock, construction and ventilation of farm buildings, should also be a part of a veterinarian's education. If one hopes to measure up to the maximum requirements of the times he should take a thorough course in animal husbandry. Such course should be considered one of the important parts of the veterinary curriculum.

There should be the closest co-operation between the veterinarian and the county farm agent. The county agent handles the problems of the farmers in a general way. He cannot visit all farms and get into close contact with every farmer. His field is too large to permit such detailed attention. The veterinarian comes into more intimate contact with the farmer. It will be mutually helpful to the veterinarian and the county agent if they co-operate fully in their work.

The following statement made by Wayne Dinsmore, former Secretary of the Percheron Society of America and now Secretary of the Horse Association of America, indicates how the stockmen of the country feel on this subject. He says:

"I am frankly of the opinion that veterinarians need this work as much as animal husbandry students in the regular agricultural colleges do; for long experience has satisfied me that veterinarians oftimes do themselves great harm through lack of knowledge of recognised breeds and types of horses and through their inability to judge intelligently of the relative merits of two horses when viewed from the standpoint of practical horsemen. It is regrettable, but none the less true, that horsemen generally consider veterinarians, as a class, very poor judges of horses, whereas they should be particularly well qualified if they are to do justice to their profession. To sum the matter up in a nutshell, in my judgment veterinarians should have the most rigorous, exhaustive training in animal husbandry work, particularly in horse judging and in feeding and management of horses of all types; but the work should be throough or not given at all, for a little knowledge is a dangerous thing, and a veterinarian who has had a smattering of judging work is the most obnoxious man among horsemen that can well be imagined. You may well emphasize also that it takes time and persistent study of large numbers of animals to develop men into satisfactory horse judges. They must study the best types of each class and each breed and by persistent study of the ideal learn to recognise inferior types at a glance, but there is no short road to learning in this particular line. The great fault with nearly all of the veterinary schools that give any work in horse judging is that they attempt to give in three months the work that the agricultural colleges take three years to cover."

What has been said by Mr. Dinsmore indicates the need and demand for a comprehensive animal husbandry course in the veterinary curriculum.

At the University of Pennsylvania we feel that we have been devoting sufficient time to all animal husbandry subjects, except practical judging, and we have just added another two hours per week for one year, so we hope for better results in that branch in the future. The work is given as follows:

The students begin studying animal husbandry the second semester of the first year. The first subject is equitation. Dr. Gay's "Productive Horse Husbandry" is used as a text-book with two one-hour recitations per week for eight weeks. We study the requirements of a good stud, construction and management of stables, care and management of the breeding stock, horsemanship, bits and bitting, riding and driving, seats and saddles, the classification and construction of vehicles, transportation and showing. Then the practical work begins. The students are taught how to splice rope, tie a few useful knots, and make three types of rope halters. Work in fitting bridles, halters, collars and harness is given next. After this they are taught how to approach a horse, lead, show him and measure his height; how he should be cleaned and feet and legs cared for, and how to decorate mane and tail for the show ring. We conclude this part of the work with a horse show. Each student is required to clean, decorate and show a horse. A prominent horse breeder acts as judge and a prize is given to the student winning first place. The students are then required to take five riding lessons at one of the best riding academies in Philadelphia. How to handle sheep in the show ring and set them up on their rumps is also taught in this course.

Market types and classes is the subject taught the first semester of the second year. Prof. Vaughan's book is used, with two one-hour recitations per week, and one afternoon per week is devoted to practical judging at the Philadelphia livestock yards. Two one-hour recitations per week, second semester, is devoted to the study of the origin, history, development, breed characteristics and economic importance of the breeds of horses, cattle, sheep and swine. Prof. Plumb's book is used as the text. Practical judging of breeds is done on near-by farms one afternoon each week.

Feeds is the next subject considered. Two one-hour periods the first semester, third year, are devoted to this work. At this time the study of the origin, classification and characteristics of our soils and the maintenance of soil fertility is introduced. This is given in the form of lectures and demonstrations. Following this we use Henry and Morrison's "Feeds and Feeding" and have recitations on the classification of feedstuffs, their production and preparation. The following semester two hours per week are devoted to feeding, which includes the

economic production of horsepower, beef, milk, mutton, wool, poultry, eggs and by-products, also the care and management of the herd and flock. This work is given in the form of lectures and recitations.

Breeding is studied next, two lectures per week, fourth year, first semester, on the history, principles and practice of breeding livestock. A general course in genetics is given as a basis for this work.

One afternoon per week, for twelve weeks, fourth semester, is used for visits to stock farms in near proximity to Philadelphia, for advanced judging of types and breeds of horses, cattle, sheep and swine. This affords our students an opportunity to see some of the best specimens of many breeds, the most modern farm buildings and their equipment, and a chance to observe the manner in which they are cared for.

There are several ways in which veterinarians who have had no training in animal husbandry can become proficient animal engineers. They can read suitable papers, attend county fairs and large livestock shows, and organise boys' and girls' calf and pig clubs or local livestock associations or cow-testing associations. By starting organisations of this kind, interest in livestock would be stimulated in the community and the veterinarian would learn a great deal about animal husbandry.—*Jrnl Amer. Vet. Med Assn.*

The Jewish Method of Slaughter.

The following letter appeared in the *Manchester Guardian* of June 21st :—

To the Editor of the Manchester Guardian.

Sir,—The attention of this Board, which is the representative body of the Jews of the British Empire, has been drawn to the following passage in a leading article in your issue of the 15th :—

> There is an old superstition that some animals make a better meal if they are slaughtered slowly and horribly. It obtains in a rather dreadful way among the Jews, and the law of England makes special allowance for the habits of their butchering.

I beg to inform your readers that no such superstition obtains among the Jews, nor is there any ground for suggesting that their method of slaughtering is either a slow or a cruel method. On the contrary, it consists of a single, swift cut across the animal's throat, severing all the vital parts in that region, and producing such an outflow of life-blood that insensibility at once supervenes. The cut is made by a skilled and constantly supervised operator with a knife sharper than a razor.

The method is essentially a humane one, and, in case proof of this be required, I enclose for your perusal (1) a volume containing the opinions of over 450 Continental experts, every one of which confirms the fact ; (2) a report containing details of the investigations made by an eminent English surgeon (Mr. Openshaw) and an equally well-known physiologist (Dr. Leonard Hill), both of whom testify to the humanity, certainty, and rapidity of the Jewish method. Mr. Openshaw, it will be noted, states in concluding his report : "I am in absolute accord with the statement of Lord Lister, 'To charge the Jews with cruelty in the matter—that is, the killing of animals—is grossly unjust.'"

These two specialists watched the slaughtering of animals and conducted their investigations at the abattoirs independently and without warning. Between them they saw the killing of 32 oxen by the Jewish method, and they found that in every case insensibility followed at once.

It is difficult to conceive what more conclusive proof of the humanity of the Jewish method could be needed.—Yours, &c., CHARLES H. L. EMANUEL,

Solicitor and Secretary.

Board of Deputies of the British Jews,
23 Finsbury Square, London, E.C.2.
June 10th.

Royal Army Veterinary Corps Annual Dinner.

The following is a list of the officers present at the above dinner, held on Friday, 16th June, 1922, at the Hotel Cecil, at 8 p.m.

Major-General W. D. Smith, C.B., C.M.G., D.S.O., presiding.

Major-Generals Sir L. J. Blenkinsop, K.C.B., D.S.O., Col. Commandant ; Sir F. Smith, K.C.M.G., C.B. ; Sir J. Moore, K.C.M.G., C.B.

Colonels G. M. Williams, C.M.G. ; F. W. Hunt, C.M.G., C.B.E. ; W. B. Walters, C.B.

Brevet Colonel A. G. Todd, C.B.E., D.S.O.

Lieut.-Colonels R. C. Cochrane, C.B.E. ; A. J. Williams, D.S.O. ; A. E. Clarke ; H. Watkins-Pitchford, C.M.G. ; E. D. Johnson, O.B.E., T.D.

Brevet Lieut.-Colonels H. S. Mosley, D.S.O. ; E. P. Argyle, D.S.O.

Majors A. F. Deacon ; B. L. Lake, D.S.O., O.B.E. ; W. Ludgate, D.S.O. ; S. F. G. Pallin, D.S.O. ; E. C. Webb, O.B.E. ; H. E. Gibbs, D.S.O. ; A. Leaning, D.S.O. ; D. Macdonald, O.B.E. ; H. J. Holness, D.S.O. ; A. J. Thompson ; K. McL. McKenzie, D.S.O. ; J. Ashmead Boseley ; A. Hodgins, D.S.O. ; T. A. Nicholas ; T. E. Campey, M.B.E. ; C. H. Hylton-Jolliffe ; A. N. M. Swanston ; P. J. Simpson, D.S.O. ; P. W. Dayer-Smith, O.B.E. ; R. G. Anderson, O.B.E., T.D. ; J. Adamson, M.C., T.D. ; J. L. C. Jones, O.B.E. ; W. Ascott, O.B.E ; C. E. Neill ; H. Peele ; H. C. Jagger, O.B.E. ; W. N. Jugenson ; F. W. C. Drinkwâter ; A. Robb.

Veterinary Major G. B. C. Rees-Mogg, O.B.E.

Brevet Majors M. P. Walsh ; C. A. Murray.

Captains A. B. Bowhay, O.B.E ; J. J. M. Soutar, O.B.E. ; W. St. J. F. Macartney ; G. F. Steevenson ; F. B. Hayes, O.B.E. ; T. L. Shea ; J. Going ; C. J. R. Lawrence, O.B.E. ; W. H. Heaney ; V. A. Bartrum, O.B.E. ; G. Lloyd, D.S.O. ; F. J. Andrews ; D. A. Gillmor ; J. Bell ; M. J. Killelea ; E. C. Bowes ; C. K. Calder ; J. Leigh ; J. Robertson ; W. E. Barry ; J. T. Angwin ; F. B. Ditmas ; F. Hopkin ; J. Tagg ; A. E. Willett ; E. R. H. Woodcock ; C. Budd, M.B.E. ; E. B. Reynolds, O.B.E. ; J. F. Ives, M.C.

Veterinary Captain B. R. Body.

Lieut. A. J. Warburton.

Lieut.-General Sir T. E. Clarke, K.C.B., K.C.M.G., Quartermaster-General to the Forces, and Dr. O. Charnock Bradley, M.D., D.Sc., Ch.B., Principal, Royal (Dick) Veterinary College, Edinburgh, were the guests of the evening.

Live Stock in Ancient Times.

I have seen so much of what modern civilisation has been able to achieve in the way of stock-breeding that I thought it might be of interest, for a change, to pay a visit to the old peoples, the founders of our civilisation, and inspect their work on these lines more closely than I have done before. One need not travel very far, indeed, in order to study the civilisation of the ancient nations. In the British Museum there is ample material for such study. Especially so if we wish to obtain a fairly correct impression of the part the old Egyptians and the Assyrians have played in the history of civilisation. But also the old Greeks are well represented there, and even the Romans, although the collections of Roman antiquities—when we except those found in England—are rather insignificant if we compare them with what we can see in Rome, in Naples, in Herculaneum and Pompeii, etc. I ought, perhaps, to add that I have visited those places, too; in fact I have seen practically all that is to be seen in Europe and the Near East, of relics from those old nations, having long been a keen student of art and of the history of civilisation.

I have recently spent considerable time in the British Museum, my principal object being to make investigations concerning the origin of our domestic breeds—the horse in particular. But the development of the domestic breeds is so closely connected with the development of the most interesting species of all—the human race—that it would be quite useless to study the animals without a fair knowledge of the peoples who bred and reared them. So I must include the human species in my researches.

The great nations who laid the foundations of our civilisation have disappeared; their places have been taken by others. Hundreds and hundreds of years have elapsed since they all passed out of history: the Egyptians, the Babylonians, the Assyrians, whom we can follow nearly 6,000 years back in time; the Greeks, who more than 2,000 years ago were more civilised than we are now, although they did not have the advantage of the scientific discoveries which have—or ought to have—enlarged our horizon; the Romans, who adopted the Greek culture and made use of it in their own way. They are all gone, those pioneer nations. There is no mysterious law governing this disappearance, for a nation, and still more an empire, is an artificial conception, very much subject to the old principle, "Might is right." But the old types of men have not disappeared from the surface of the earth, although they may not be found where they used to live. Neither have the types of animals they reared gone out of existence; as a matter of fact, we can find exactly the same types of animals nowadays as those depicted in sculptures and paintings, from palaces and tombs built thousands of years ago. Which shows us that evolution must be very slow, a period of some thousands of years being too insignificant to produce any appreciable change in type—not to speak of species!

Subject to altered conditions, a breed may vary in size and quality, but the fundamental characteristics, the type, will remain unaltered. New breeds, new types, may be established; but only by means of crossing and re-crossing the original types with others, and through artificial selection within breeds already established by crossing. I believe in the evolution theory; but I am also sure that we know absolutely nothing about the laws governing evolution; they remain to be discovered yet. Anyhow, it may be safe to say that the evolution process must have taken millions and millions of years, and that the different species of domestic animals must have been evolved ages before "historic times" began, when people began to make lasting records of their doings.

We can trace civilisation some 6,000 years back; so far back goes the "historic time." But civilisation must have begun long before that; it began when people learnt to talk clearly, so that thoughts and ideas could be communicated from one person to another. It is certainly wrong to presume that in "pre-historic times" human beings were all "Cave-dwellers," "Neanderthalers," and "Missing Links." They were, of course, more or less savages; but they must have been of exactly the same type as the peoples of to-day thousands of years before any records were made. Besides, "pre-historic times" is a rather vague conception; it does not mean the same when applied to Europe as when applied to Egypt and parts of Asia, for instance, the difference in time being something like 4,000 years. I shall not, however, weary my readers more than necessary with these rather abstract theories. We will now examine the parts the ancient nations played in civilisation with regard to stock-breeding.

There can be little doubt that it was the peoples of Asia who started the taming of wild animals and developed them into domestic breeds. It is true that the history of Egypt is slightly older than that of the Babylonians and the Assyrians; but that is only because the Egyptians were the first to find means of making lasting records. The domesticating of animals must have taken place a long time before the Egyptians discovered the art of drawing and cutting intelligible marks in stone. Besides, the old Egyptians were of Asiatic origin themselves, or, at least, strongly influenced by infusion of Asiatic blood. It is, therefore, very probable that they brought their domestic animals with them when they first settled in Egypt. Moreover, the various species of domestic animals differ materially from the wild animals of Africa, while they are closely related to wild breeds which still are in existence in Asia.

If we judge from the many excellent statues of prominent Egyptians, preserved from the very early times, the ruling classes of Egypt must have been of a predominant Mongolian type, somewhat influenced by Semitic (Assyrian) blood, while we also find pronounced African and even European types depicted. The race question does not seem to have troubled those ancients very much; a black basalt statue of a kneeling negro is not that of a slave; it portrays the commander-in-chief of the armies of "the North and the South." One of the old kings, Rameses II. (about 1,300 B.C.), seems to have been a particularly vain man; he has had dozens of statues made of himself. And while all these statues portray the same face, of outspoken Mongolian type, some of them have been provided with a straight nose, others with a curved one; which of them had been "idealised" I could not tell. Even his mummy, which now is considered a curio, does not show the exact shape of his nose.

The Egyptians did not seem to be great horsemen. In fact, they did not seem to be much interested in horses at all. For if they had been so they would have been sure to give the horse a more prominent place in their sculptures and pictures. The king referred to above, Rameses II. (also called "Pharaoh"). seems, however, to have been rather keen on horses. I suppose his vanity may have accounted for this fact. On wall pictures from old tombs he is depicted driving in chariots; and about his period chariot driving seems to have been in vogue in Egypt, but not riding. The horses, as well as the chariots, may have been imported from Asia, although the Egyptians seem to have introduced styles different from those of the Assyrians, the horsemen "par excellence" of the period. We see, for instance, that the Egyptians, unlike the Assyrians, were anxious to keep the horses' necks well-raised, and their heads perpendicular, and they applied for that purpose a sort of "bear rein" or auxiliary rein, tightly strapped.

It is difficult form these old pictures to form an exact impression of the type of horse used by the Egyptians; for we have only paintings to go by, and while the old sculptures were true to nature, the pictures were rather crude. Sculpture has always been ahead of painting, especially where depicting of horses is concerned. Even the Greeks, who were unsurpassed as sculptors, made rather crude drawings and paintings. And even the pictures of famous race-horses, which adorn the walls of so many wealthy people's mansions of to-day, resemble anything but the animals they are supposed to portray. But we can see from the pictures that the Egyptian horses must have been well bred and high spirited, of a "blood-

like " stamp and medium size. The types depicted are more like American trotters than Arabs; but they must have been gallopers and not trotters, to judge from the pictures, and if we allow for faulty drawing, they may easily have been of the same type as the Assyrian horse, of which we find excellent sculptures (reliefs) in the Assyrian collections, and which must have been very much the same type as the Syrian horse of to-day.

What part the old Egyptian horse has played in the ancestry of the Barb horse is, of course, difficult to say. But I do not see any justification for the belief that the Arab descends from the Barb. On the contrary, it is infinitely more likely that the Barb is of Arab descent, or, at least, strongly influenced by the Arab. For the Bedouins of Northern Africa came from Arabia; they invaded Africa and even Spain under the caliphs, in the 8th century after Christ, and, horsemen as they were, they, of course, brought their horses with them; not only to Africa, but also to Spain. I do not think there should be any shadow of doubt that the Arab horse descends from the Assyrian horse; a question I shall come back to in my next article, in which I shall deal with the Assyrians, one of the most " horsey " nations that ever existed.

However, before leaving the Egyptians, I will repeat that this old nation, with due regard to Rameses and his successors, were on the whole little interested in horses and horse-breeding. But they were great cattle breeders, and their cattle were much of the same types as the European breeds of to-day.—*Capt. Munck, in the Live Stock Journal.*

Meat Inspection.

Although the efficient inspection of meat supplies has long been recognised to be one of the most important duties of sanitary authorities, these bodies appear to have very different ideas as to the manner in which their obligations in this respect should be discharged. In some localities the inspection is carried out by well-trained officials, and is thorough and complete; in others there is, for all practical purposes, no inspection at all; between these two extremes are a very large number of districts in which inspections are made by sanitary inspectors who have had no special training in the duties of meat inspection. At the end of 1921 a Departmental Committee reported to the Minister of Health as to the administrative measures necessary to secure adequate protection for the health of the people in connection with the slaughter of animals and distribution of meat for human consumption. Some of the recommendations of the Committee can be carried out without recourse to further legislation, while others will require the sanction of Parliament; in the latter category is a proposal that there should be a system of marking of meat which has been duly inspected at the place of slaughter. Without waiting for increased statutory powers a great deal can be done by local authorities by way of increasing the efficiency of inspection. To this end the Minister of Health has issued a memorandum in which he sets out the system of inspection he recommends for adoption. The routine of this inspection is the minimum which would be followed by a well-trained inspector, and the details are sufficiently clearly expressed to enable a partially-trained inspector to make a much more thorough inspection than he has perhaps been in the habit of doing. It is recommended that the entire carcase and organs shall be condemned when there is found either generalised tuberculosis or tuberculosis with emaciation, and a very clear statement is made as to the conditions which should assist in determining whether the disease is generalised. Where there are only localised lesions it is recommended that the parts containing the lesions and the contiguous parts shall be condemned. A list of thirty-three conditions is given, the existence of which should lead to the condemnation of the entire carcase. This official recommendation should serve to bring about greater uniformity in the action of meat inspectors than has hitherto prevailed. In a circular accompanying the memorandum the Minister of Health refers with approval to the recommendation of the departmental committee that local authorities in charge of markets or large abattoirs should be urged to give facilities for demonstrations which inspectors and candidates for meat inspection certificates might attend. He concurs also in the suggestion of the committee that there should be two grades of inspectors: one of " lay inspectors "—that is to say, sanitary inspectors holding a meat certificate, possessing sufficient knowledge of the work to enable them to recognise abnormalities, to decide and interpret a definite schedule of inspection, and to recognise those cases requiring more expert knowledge than they possess; the second grade would include expert inspectors, presumably qualified veterinary practitioners, who could assist the lay inspectors in time of difficulty, and in large areas would supervise their work.—*British Medical Journal.*

2,000-gallon Cows.

WHY SOME BREEDERS ARE OPPOSED TO ABNORMAL YIELDS.

There appears, writes an agricultural correspondent of the *Sunday Times*, to be some modification of the views held in certain quarters as to the wisdom of trying to get abnormal yields of milk from certain breeds of cows. Quite the rage of recent years have been the British Friesians, whose milk yields in certain cases have been phenomenal, even allowing for the relatively small butter content, as compared with shorthorns and Jerseys. In some cases up to 2,000 gallons and more have been obtained per annum from a single cow.

But in certain of these cases, however, it has been discovered that these are really " freak " results, as is instanced by the fact that one animal which gave over 2,000 gallons of milk has been dry ever since for the whole of this year. The outcome is a much lower paying average return than was originally contemplated.

In conversation with the manager of a large herd of Friesians, the *Sunday Times* learnt that the complete falling away in this direction has led to new methods being adopted by which it is hoped to get 1,000 gallons per annum with consistent regularity. No more so-called " freak " results are to be aimed at in the case of this particular herd, and it is just possible that other breeders and dairy farmers will follow suit.

In some quarters it is considered that these abnormal yields impose too great a strain upon the animal, and that a steady average of 1,000 gallons per annum would represent the best paying yield in the long run.

International Horse Endurance Trials.

A Belgian Society named " Le Cheval Utile et Endurant " has organised some International horse trials to take place at Ostend from the 23rd to 29th August this year. Prizes will be distributed to the value of 50,000 frs., which sum will be divided equally between the " mounted " and " harnessed " events. Other prizes and medals may be expected to be awarded in addition.

In the " mounted " trials the ages of horses are required generally to be between 7 and 15 years, though thoroughbreds may be between 6 and 15. In the " harnessed " trials, the ages are to be between 5 and 15 years. The entry fee is 200 frs. for each animal. The organisers are hopeful that there will be several entries from Britain.

Full particulars of the trials are to be obtained from the Commandant Leynen, Secretary-General, " Le Cheval Utile et Endurant," 110 Chaussee de Haecht, Brussels. The last day for receiving entries is 5th August.

The Veterinary Record.
8th July, 1922.

THE COUNTRYSIDE AROUND BATH.

The country surrounding Bath is full of interest from an agricultural as well as a sporting and scenic point of view. A tour of this country will show that between Bath and Bristol, right to the gates of both towns, dairy farming is carried on extensively.

Going north-west we come to the Chipping Sodbury Vale (Glos.), with its numerous dairy farms, then working right-handed brings us towards Badminton, the seat of the Duke of Beaufort, and the kennels of his famous foxhounds.

On these uplands are some splendid tillage farms, mixed with pasture land, which carry sheep and cattle of good quality, and the farming is generally of a high standard.

Proceeding in an easterly direction (although we are loth not to be able to take our route still further north-east towards Tetbury and Cirencester, where the farming is well worth seeing), we come again to the dairy country round Malmesbury, a fine old town, with its ruined Abbey and six bridges over the River Avon. This is a great sporting and agricultural centre. As our mileage is limited, we must draw south to Chippenham. All the way we pass through a grand dairy and hunting country, and on the left of us is Dauntsey Vale, the pick of the Duke of Beaufort's hunting country.

Chippenham is a great hunting centre; a fine old market town, with cattle and corn markets, milk factory, and bacon curing factories. From Chippenham we carry on to Calne, celebrated for its many beauties.

Due east from here, on the main London road, towards Marlborough, we come quickly on to a great change of scene as we view the magnificent Down land with its well-farmed tillage lands. These farms carry some splendid flocks of sheep and grow good corn.

We will not go on to Marlborough, although we ought to do so, but turn at the cross roads at Beckhampton, which will be recognised by our sporting companions on this tour as the celebrated racehorse training ground of F. Darling, whose well-known father, apart from his racing successes, used to take many prizes with his Down sheep.

It may sound like teaching the French to speak their own language to mention that Wiltshire abounds with racehorse training stables, about which many of us read, even if we are not able actually to visit them!

From this point to Marlborough and Salisbury, and from there back to Devizes, we travel over magnificent Down land (Salisbury Plain), with well-farmed tillage and sheep farms. There are several large sheep fairs held on this side of Wilts.

From Beckhampton we go to Devizes, the western capital of the county, an active market town, with a large corn trade, cattle market and bacon factory, not forgetting the headquarters of the Wilts Constabulary. Now in a westerly direction (through a pasture country) to Trowbridge, with its cloth factories and good cattle market. Near here, also, are large milk factories at Staverton and Melksham, and the kennels of the Avon Vale Foxhounds.

We will now go south to Westbury, a picturesque town at the foot of Salisbury Plain. Here we again strike tillage land, but leave it on our left when we reach Warminster, an old market town, where a new and commodious cattle market has just been opened. South of Warminster, towards Dorset, lies a grand Down country, with splendid sheep and tillage farms right away to Shaftesbury (Dorset) and Blandford. We would like to wander on that way, but must proceed to Frome (Somerset), again in a pasture country, where a well-known annual cheese fair is held. We are now approaching the country where the original Cheddar cheeses were made, although, as is well known, these are now made in other parts, especially in Wilts, Dorset, and parts of Scotland, as also Canada.

South and west of here dairy farms abound with good quality cattle. From Frome we return to Bath through pretty scenery. This journey will have been too long for most people, and we would suggest that in reality it might be taken with great pleasure piecemeal during a course of Bath waters, which course would be enjoyed by all. The words of the immortal Mr. Jorrocks when referring to Handley Cross apply suitably here: ". . . the health-giving qualities of whose gushing waters would draw people from all nations of the earth. Air, water, and exercise would cure anything that was capable of relief."

> "Better to rove in fields for health unbought,
> Than fee the doctor for a nauseous draught."

Abstracts and Reviews.

Work in Southern Rhodesia.

VETERINARY BACTERIOLOGIST'S REPORT.

(*Continued.*)

Infectious Abortion.—It is generally believed that the principal source of infection is by the ingestion of infective material, and that infection by the bull is of less importance than was at one time supposed. In this country, however, outbreaks have occurred which apparently originated with the introduction of a new bull to the herd. The following figures are therefore of interest:—

Infection of Bulls.

Total number of infected herds... ...	117
Total number of bulls tested	202
Total number of bulls yielding positive re-actions	19 (or 9.4%)

The treatment of cattle in infected herds by the special vaccine prepared at this laboratory has found favour not only with the great majority of owners of treated cattle, but also with the members of the veterinary profession, who at a recent meeting of the Southern Rhodesia Veterinary Association re-affirmed the high opinion of it expressed at the Veterinary Conference held in August, 1920, and decided that the good results obtained justified its continued use. Measures of quarantine and control were formulated based upon its application. The approval of practical members of the profession largely discounts the reviews of those who have unfavourably criticised the vaccine on the assumption that it is the same as the so-called "dead" vaccine in which the organisms and their properties have been destroyed by heat. As explained in previous reports, the Rhodesian vaccine is not submitted to heat, but to a special process which renders the bacillus inert without destroying those properties which are necessary for the production of anti-bodies. Thus the response to this vaccine, as indicated by the agglutination titre of the blood, compares favourably with that produced by a similar quantity of living organisms, and the vaccine appears to be a valuable substitute for the so-called "live" vaccine, which under the conditions obtaining in this country cannot be applied without grave danger. In some cases where results have been disappointing, careful enquiry has shown that instructions were not carried out, or that many of the animals at the time of treatment were already well advanced in pregnancy and probably infected, so that the expulsion of the calf was inevitable. In some cases also the dose was too small to render the animals immune throughout the nine months of pregnancy; but this was soon realised and promptly rectified, free issues of vaccine being supplied to the owners of herds in which abortions had continued to occur. Attention has been forcibly drawn to the danger of relying upon the disease to "wear itself out." What generally happens in this country is that the disease assumes a chronic form in a herd, and although abortions are rarely detected, the low calf crop and the large number of sterile cows indicates its presence. Like a smouldering fire, the outbreak bursts into flame again with the addition of new fuel in the form of uninfected and susceptible female stock introduced to the herd. Such outbreaks have frequently escaped detection by the agglutination test until an abortion has occurred in a newly introduced cow which has re-acted to the test. It is pleasing to record that the best results have attended the use of the vaccine in such outbreaks, and in one very valuable herd of Shorthorns in which a healthy calf has not been born for several years, a number of cows which were condemned as barren, after treatment, became pregnant. Some have given birth to healthy calves, and the rest appear to be holding their calves to full term. It is probable that in this country such barren or "queen" cows, acting as "carriers," are a frequent source of danger, and if the vaccine treatment succeeds in eliminating these cases it is of inestimable value. It is felt that the methods adopted by the Veterinary Department of this Territory in dealing with infectious abortion compare more than favourably with those obtaining elsewhere. However imperfect they may be, an earnest endeavour has been made to cope with a disease which other Administrations have admitted their inability to control, and have removed from the list of scheduled diseases, a course which would not commend itself to the stock-owning community of Rhodesia. It has recently been suggested that the infectious abortion of cattle as it occurs in this country is related to a disease of human subjects closely resembling undulant or Malta fever. The *Bacillus abortus* of Bang certainly bears a close morphological and biological resemblance to the *Micrococcus melitensis*; seriological tests also indicate a close affinity, in that certain strains of *M. melitensis* can be agglutinated with serum from cattle infected with infectious abortion, and strains of *B. abortus* can be agglutinated by serum from human patients suffering from undulant fever. Certain cases presenting symptoms resembling undulant fever have occurred in Southern Rhodesia in men who, as far as is known, cannot have obtained infection from goats, but have resided on farms where animals are or have been infected with infectious abortion. It is suggested that these cases are suffering from an infection caused by the *B. abortus* of cattle. It is also suggested that human females may contract infectious abortion through the ingestion of the organism in milk and dairy products from infected cows. Although infectious abortion of cattle is prevalent in other parts of the world, it has not been accused of causing the symptoms of undulant fever in man, nor has it been proved to cause abortion in human subjects. Infectious abortion has prevailed in the Marandellas district for many years, but it is only within the last few months that cases resembling undulant fever in man have been recorded. While circumstantial evidence points to the infection of man by the *B. abortus* of Bang, and scientific tests up to a point support this suspicion, the final proof is not yet available. This is a serious matter requiring immediate and careful investigation.

Horse-Sickness.—The inoculation of horses by the Rhodesian method has been continued with considerable success. Seventy-seven remounts for the British South Africa Police were treated at the Drill Hall stables, and were useful for experiment and observation, but the greater risks associated with research could not be taken with such costly animals. A number of privately-owned horses of varying ages was also inoculated by the Bacterio-

logist, and the results obtained proved of considerable interest and importance. Of the horses thus treated, six died, or 5·45 per cent., as against 7·26 per cent. for the year 1920 and 13·8 per cent. for the year 1919. At the commencement of the year there were 297 inoculated horses on the strength of the British South Africa Police, and at the end of the year 308, 77 remounts having been added during the year and 66 having been struck off the strength. Approximately 300 horses have thus been exposed to infection during the year, and of these 17 are stated to have died of horse-sickness, or 5·6 per cent. The actual percentage of deaths from horse-sickness may be less, as it is probable that several of the animals reported to have died from horse-sickness died from some other cause. This compares favourably with the death rate among privately-owned horses inoculated last year, which from the few figures available appears to be about 9.3 per cent. It may be remarked, however, that one hears more about the failures than the successes, and the real average is undoubtedly very much less. Owners are often extremely poor horsemasters and diagnosticians, and the term "horse-sickness" is used to cover a multitude of ills. The figure is increased also by the inclusion of deaths in part of the Victoria district, where for some reason horses inoculated by the District Veterinary Surgeon have not proved immune, the death rate being as high as 28·5 per cent. This is difficult to explain in view of the fact that of 25 Police horses inoculated by the Bacteriologist and exposed throughout the district to every risk, two only are reported to have died of horse-sickness; and on the Nuanetsi Ranch three horses inoculated by him have survived, while five others inoculated locally have died. Inoculated horses when exposed to natural infection become re-infected with the virus of the district to which they are sent; thus among inoculated Police horses 60 are known to have developed horse-sickness during the past season, but 50 of them recovered after a few days' illness. In Police Orders it is laid down that when horses show a temperature or symptoms that they are suffering from horse-sickness they shall be kept undisturbed in a quiet cool place, without special medicinal treatment, until again normal. Although similar instructions are issued to the public, they are not so carefully observed. In the past the inoculation of horses for the public has only been applied by District Veterinary Surgeons to animals not exceeding two-and-a-half years of age, on the ground that young horses often possess some degree of immunity which favourably modifies the re-action. But it has now been found that this is not entirely an advantage, in that a number of cases do not re-act at all, and thus derive no immunity. The difficulty in handling and temperaturing young unbroken animals renders it impossible to decide whether they have re-acted or not, and many which derive no benefit from the treatment succumb later from natural infection. The risk of inoculating older horses is greater, but the after results are better, as the majority of them re-act at the time of inoculation. The condition, age and individual susceptibility of the animal also play an important part, and for that reason it is thought best that the inoculation of older animals shall remain a laboratory process. It must again be pointed out that this method of inoculation is by no means perfect, being to a large extent empirical, and must remain so until further observation and research has been carried out. All that can be said of the existing method is that it has cost nothing, it has revolutionised the Police as a mounted force, and it has rendered horse-breeding in Rhodesia a practical and profitable proposition. From the personal point of view, however, it would be better to suspend any further issue of vaccine until the method has been placed upon a more scientific basis.

Bovine Plasmoses.—It is to be regretted that no valuable imported stock have been forwarded for inoculation against redwater and gall-sickness during the present year. This is chiefly due to the difficulty of obtaining freight from Great Britain and the excessive shipping and railage charges. The more general application of systematic dipping has also rendered it possible to introduce highly bred cattle to "clean" farms with so little risk that owners have come to regard inoculation as unnecessary. Some of the more venturesome have lived to regret their decision. Another reason why it has been unnecessary to send cattle to the inoculation station at Salisbury is that the virus now used for immunising is of such low virulence that it can be applied to suitable animals on the owner's premises. With the increased application of dipping, the necessity for rendering young stock immune against redwater and gall-sickness becomes greater, and already breeders of better class stock on regularly dipped farms are finding that the market for their susceptible cattle is restricted. The more progressive stockmen, including many pre-eminent in the show ring, are inoculating their calves by the method devised at this laboratory with considerable success. In spite of lectures and pamphlets, the benefits to be derived from this process do not appear to be generally understood. Recent reports show that animals so inoculated and exported to Portuguese East Africa have lived where hitherto the majority of imported stock have died, and it is hoped that when stock markets have returned to normal conditions advantage will be taken of this fact.

Trypanosomiasis.—A few cases of trypanosomiasis have been recorded, and where the drug treatment has been applied it has proved successful. Some authorities continue to attribute these outbreaks to mechanical transmission by blood-sucking flies other than the tsetse. If this were a common method of infection, the dispersal of reservoirs by shooting expeditions would appear to be unjustifiable; but although cases of mechanical transmission may occasionally occur, the conditions necessary for such infection do not commonly obtain in this country. Briefly, these are the introduction of the disease by an infected animal containing a large number of trypanosomes in its peripheral blood to a district where suitable conditions of heat and moisture prevail, close contact among animals, and a large number of biting insects. A combination of such conditions is rarely met with in Southern Rhodesia, and practical experience shows that if mechanical transmission takes place it is the exception rather than the rule.

Vaccines.—It is anticipated that when the new veterinary research station now in course of construction is completed, equipped and organised, the output of vaccines will be considerably increased, but the question arises whether vaccine should be sold at a profit or at cost price to the public, inasmuch as the primary object of the

institution is to safeguard and assist the pastoral industry. It must be borne in mind, however, that to produce larger quantities of vaccine will involve increased expenditure on staff and equipment.

Staff.—During the year the staff has comprised the following officers :—

L. E. W. Bevan, Government Veterinary Bacteriologist.
A. J. Crisp, Senior Technical Assistant.
Miss M. Perrins, Junior Technical Assistant and Senior Clerical Assistant.
Miss O. R. Newton, Junior Clerical Assistant.
H. E. Browne, Stockman.

Ll. E. W. Bevan,
Government Veterinary Bacteriologist.

The Treatment of Joint-Ill in Foals with the Dam's Blood.

The etiology of joint-ill in foals has been, as is well known, much discussed during the last twenty years. From the investigations of several bacteriologists we now know pretty clearly the different kinds of bacteria found in cases of joint-ill. But the question as to how foals are infected has not yet been satisfactorily answered. From their investigations of the carcases of foals, bacteriologists have concluded that infection takes place through the navel and that these cases should be regarded as common wound infections with pyo-septicemia as a result. On this point the reader should consult the articles written by Ostertag, Vath, M'Fadyean and Edwards, Adsersen, Magnusson and others. On the other hand, stud veterinary surgeons especially, such as Sohnle, Bernhardt, Mieckley, Mann and others, and also bacteriologists such as Schofield and others, have shown that the foal is already infected within the uterus. It has been observed that not only the foals of a certain dam die year after year, but even the foals of other dams in the same stud contract the disease. Cases have also been met with where the same morbific agent was found in the womb of the dam as that found in the joints of a foal which had died of joint-ill (Sohnle). It has also been proved that joint-ill stands in intimate relation to infectious abortion in mares (Schofield and others).

For my part, I am of the opinion that the dam is the most common carrier of the joint-ill virus, and that she is frequently affected with an endometritis and infects the foal already in the uterus or at birth. It is also possible that the mare carries the virus in her intestines, as was pointed out by Magnusson, and infects the foal after birth either through the mouth or through the navel. Even the milk of the dam has been suspected of being the cause of infecting the foal. But on the other hand it cannot be denied that cases of common wound infection through the navel occur.

When a mare does not suffer from the infection she is supposed to carry antibodies against it. Sohnle was the first to point this out. On this question he writes (*Zeitschrift für Gestütskunde*, 1910, part 11) that the newborn also inherits such antibodies and this explains why the foal does not contract the disease before a lapse of ten days or more. He writes also that he believes that the serum of the dam could be used as a prophylactic on the foal, while it would add to the opsonian power of the foal's blood. However, he has never tried this method and no one has tested his theory. But Sohnle, in treating cases of joint-ill, has only used serum from a serum horse treated with cultures from foals which had died of joint-ill.

I have gone further than Sohnle and in *Svensk Veterinartidskrift*, 1915, part 5, recommended the use of the serum from the dam for the treatment of joint-ill. In the following year, 1916, I published an article in the *Berliner Tierärztliche Wochenschrift*, part 12. Since then articles have been published with reference to the very good results of this method of treatment, as will be seen below, and many practitioners have also informed me of many cases in which they used this method with excellent results.

But in order to be able to use the serum from the dam there must be at least one day's delay, and therefore I have recommended the method of injecting the blood of the dam direct. For this purpose the method of R. Lewisohn (*Münchener Medizinische Wochenschrift*, 1915) is the most simple. Lewisohn adds neutral sodium citrate to the blood in the proportion of 2 per 1,000. By this means coagulation of the blood of man and dogs is prevented for a period of 24 hours, but from my own observations, there is no coagulation at all in the blood of horses. Thus, prepared blood can be injected intravenously without any danger, and it is also easily resorbed after subcutaneous application. This method was used by Lewisohn for the purpose of blood transfusion after numerous bleedings or in cases of anæmia as a consequence of septicæmia.

The technic in using this method of treating joint-ill is the following :

Instruments, such as bleeding needles, knife, syringe, and bottle or vessel for catching the blood, should be boiled, but care should be taken that the water used for this purpose does not contain a high percentage of lime, as the blood will then coagulate in spite of the addition of sodium citrate. In such cases distilled water should be used, or else the water should be boiled once before being used for the instruments, or more citrate should be added to the blood. Solution of sodium citrate, 1 to 50, is poured into the bottle or vessel which is to be used for catching the blood, and then shaken so that the walls of the vessel are moistened. Care should be taken that the blood does not foam, because foaming blood coagulates easily. During the bleeding the blood must be shaken or stirred gently so as to mix it with the citrate. One gram of sodium citrate is sufficient for 500 c.c. of blood, and this much, or a little less, is the quantity generally used as a dose.

Blood treated in this manner can be injected either subcutaneously or intravenously. When injecting subcutaneously the quantity of blood is divided so that 50 or 100 c.c. is injected at each place. The best places for injection are the sides of the neck and of the chest. For subcutaneous injection it is not necessary to mix the blood with the citrate ; as a matter of fact it is even possible to inject the blood direct. A needle is put into the dam's vein and another needle subcutaneously into the foal. By means of a large syringe, warmed by hot water, 50 or 100 c.c. of blood is taken out of the dam's vein and rapidly injected into the foal. Then the needle in the foal is inserted at another point and a new quantity injected. This method of injecting without the addition of citrate

was first used by Meyer for this purpose; otherwise it has been used in auto-transfusing blood.

When injecting intravenously it is advisable to add the citrate, and to add it as described here, otherwise thrombosis is to be feared. The blood should be kept at body temperature, which can easily be done by placing the bottle or vessel containing the blood into a vessel at this or a little higher temperature. The injection can be made either with a syringe or through a funnel, but in every case it must be made *slowly* and without any great pressure, otherwise there is a danger of the foal getting an acute dilatation of the heart.

It is natural that the earlier the foal is treated the better the result to be expected. In a case of intravenous injection one may, of course, expect that the foal will recover earlier than if the injection had been made subcutaneously; but it still remains to be investigated whether it is not advisable to inject simultaneously 200 or 300 c.c. intravenously and the same quantity subcutaneously. The subcutaneously injected blood is less rapidly absorbed and is thus effective for a longer period of time.

Some cases have been reported where an anaphylaxis resulted from the injection. This can be prevented by pinching the india-rubber tube for a few minutes after injecting 20 or 25 c.c. of the blood or serum, after which the remainder is injected. This Lieblich, among others, has prevented an anaphylaxis.

Out of 157 cases (of which the author gives particulars), 127 cases were treated with success while in 30 the foals died. Still it may be assumed that some of the unsuccessful cases could have been saved if the treatment had taken place at an earlier stage of the disease or if sufficient quantities of serum had been administered or the treatment repeated.

Of course it can never be imagined that in cases of joint-ill all the foals can be cured by this method, even if they are treated at an early stage of the disease. It is a well-known fact that all animals have not the same possibility of producing antibodies. In cases of infectious abortion in mares it has been shown, for example, by Glanders (*Deutsche Tierärztliche Wochenschrift*, part 21, 1920) that the serum of a mare which has aborted may not agglutinate the bacteria cultivated from the carcass of her own fœtus. It has also been found many times that not all serum horses are well adapted for producing powerful serum. Thus it is not astonishing if the dam should not have antibodies enough to save her foal in a case of joint-ill. Besides, it may have been a common navel infection.

All the cases mentioned were reported to the author by letter by the veterinary surgeons who treated them. One of my colleagues, District Veterinarian Hulten, Mariefred, has also tried to treat foals preventively. In one case a dam had lost her foals three years in succession. In the fourth year the foal was inoculated with the dam's blood subcutaneously on the day after it was born and it escaped the disease.

On a large Swedish estate many cases of joint-ill had occurred during the preceding three years. In the first year 1 foal died. In the second year 5 foals were born, of which 1 died. In the third year 11 foals were born, and 1 was aborted. Three became ill, one of which died, while the other 2 recovered after having been treated with antistreptococcus serum from the laboratory of the Agricultural Society at Malmö, Sweden (Chief, Dr. H. Magnusson). One of the foals is said to have been only slightly affected, the other moderately so. In the fourth year 10 foals were born, all of which were treated preventively with serum from the dams. None became affected with the disease.

In the German literature on the subject of joint-ill during the last few years many authors have written of cases where the foals were treated with the dam's serum.

The ideal method of treating joint-ill in foals, as in cases of other infectious diseases, is, of course, to have a good serum produced by ordinary serum horses, but so long as this is lacking the method of treatment with the dam's blood or serum seems to be well worth trying.

GERH, FORSSELL, *Journal of the American Veterinary Medical Association*, 1921, *March*, *pp.* 603—675.

The First Veterinary Book.

The first work known that was devoted entirely to veterinary medicine was written by Publius Vegetius Renatus* (450-500 A.D.). It was published in Basle in 1528 and is believed to be the first veterinary book printed. The manuscript from which the book was printed is the first one known in which the word "veterinary" was used. The book refers to the remarkable fact that the treatment of animals has always been regarded as a low occupation and beneath the dignity of the educated mind, but Vegetius attempts to set things right by pointing out that knowledge is never mean, low, nor contemptible, and there can be no shame in practising a profession that can save the State from loss. The ground covered is a vast one and conveys the impression of having been written by a profound student. It deals with classification of disease, the fallacy of charms and superstitions, good hygiene, treatment of colics by tapping, exercise and nitre for founder, fistula of the withers, poll evil, oaken distemper (tetanus), ulceration of the lungs in oxen (bovine tuberculosis), blood in the urine (azoturia), the benefits of quarantine, and a wealth of other material that shows the broadness of his observations, studies and teachings.— *Veterinary Medicine.*

The Milk Problem in Hot Climates.

The adulteration of milk is almost universal in Indian bazaars, and a large proportion of the milk supply is contaminated. In most cities the milk is in the hands of men ignorant of the elements of sanitation and addicted to uncleanly practices. Moreover, the milk is liable to be contaminated in transit. On the other hand, the price of milk is high and the problem of improving the purity without raising the price is a difficult one.—GOVERNMENT OF INDIA RESOLUTION, 1914.

The word milk in England, unless qualified, means cow's milk, but in hot climates it may mean cow's,buffalo's, goat's, or even sheep's milk. The two chief sources of milk are, however, the cow and the buffalo, and most samples in warm countries consist of a mixture of both.

Nearly a dozen years ago I published a report on "Milk in India" (*Journal of the R.A.M.C., Vol. vi., p.* 187). I examined in Government of India Military Laboratories three hundred and fifty samples, and found that cow's

* Early Hist. Vet. Med., by F. Smith.

milk was uniformly above and buffalo's uniformly below the standard laid down by various writers.

My averages were as follows :—

	Cow's.	Buffalo's.
Water	88·7	83·7
Total solids	11·3	16·3
Non-fatty solids ...	8·3	10·0
Fat	3·0	6·3
Ash	0·7	0·7

I paid special attention to the composition of buffalo's milk and the average result of my 124 samples was as follows: Specific gravity, 1034·04; total solids, 15·9; fat, 5·9; non-fatty solids, 10·0. I have compared my results with those of other investigators and find the chemical composition of cow's milk in the tropics may be summarised as follows :—

1. Specific gravity ...	10·27 to 10·32
2. Total solids ...	13·10 to 17·22%
3. Fat	3·4 to 7·71%
4. Solids not fat ...	9·7 to 9·51%
5. Lactose	4·03 to 4·4 %
6. Ash	0·69 to 0·75%
7. Water	86·90 to 82·78%

The above maxima and minima show that the chemical composition of milk, certified by veterinary inspectors as produced under decent conditions, varies very widely.

The following summary of a large number of analyses shows that the compositions of buffalo's milk may be stated as under :—

1. Specific gravity ...	10·27 to 10·35
2. Total solids ...	13·82 to 22·90%
3. Fat	5·00 to 11·6 %
4. Solids not fat ...	8·82 to 11·30%
5. Lactose	4·03 to 5·25%
6. Ash	0·75 to 0·8 %
7. Water	77·10 to 86·18%

The above maxima and minima show what a variable product buffalo's milk can be. The result of my investigations may be summarised as follows :—

1. Cow's milk of Indian Government dairies is above the standard laid down in Board of Agriculture's Order.
2. The analyses do not compare favourably with English dairies.
3. Buffalo's milk from Government dairies is, in its percentages of fat and total solids, much below the standards laid down by all authors, with the exception of Richmond and Peppel.
4. The results of analyses of buffalo's milk indicate that the amount of butter fat is most in warm moist climates like Bengal and least in cool dry climates like the Punjab.
5. I demonstrated that no general standard can be fixed for the tropics generally, and especially that the percentage of fats usually accepted requires re-consideration.

My published results referred to chemical analyses of milk, and these are useful, as they enable us to say if a sample of milk is genuine or not, but they do not reveal contamination. Milk may pass the chemical test and yet be not only dirty but infected with pathogenic organisms.

I also devoted considerable attention to bacteriological examinations, and have had opportunity of comparing my results with those of other investigators in the tropics of recent years, notably the late Dr. L. L. Joshi, of Bombay. The routine procedure adopted has been: (1) Microscopical examination of centrifugalised sediment; (2) examination of number of microbes per cubic centimetre; (3) test of lactose fermenters in different dilutions; (4) examination for B. coli communis and B. enteritidis sporogenes. To those who are not familiar with the bacteriological examination of milk the following figures may be of interest :—

SEWAGE *micro-organisms.*

	Per c.cm. millions.
England	2 to 11
Boston	2 to 3

MILK (240 samples) *micro-organisms.*

	Per c.cm. millions.
England (Summer) ...	20 to 30
„ (Winter) ...	3 to 5
India	36

It will be seen that the bacterial contents of milk in India and England are often greater than those of sewage.

Generally speaking, no bacterial standards for milk have been fixed, but Dr. Joshi, in the light of his experience as Municipal Analyst for Bombay, suggested the following :—

(1) Microbes per cubic centimetre. The total number of microbes should not exceed two millions from November till March and five millions from April till October.
(2) Lactose fermenters should be absent from one cubic centimetre.
(3) Centrifugalised sediment. Only a few streptococci should be present and pus cells should be absent.
(4) Pathogenic organisms. Nil.

I cannot support (1) and (2) of these standards, as the first is too low and the second far too high. The standards laid down by the Ministry of Health, and which are being worked on by county laboratories in England, are as follows :—

(1) Micro-organisms per cubic centimetre, 30,000.
(2) Organisms of the coli group, *i.e.*, lactose fermenters, absent from 0·1 of a cubic centimetre.

Dr. C. Ponder, Assistant County Medical Officer and Bacteriologist for Kent, assures me that B. coli organisms are always to be found in one cubic centimetre of milk even from the best farms. Milk, to be even reasonably safe, should not show more than half-a-million micro-organims per cubic centimetre at any time of the year, and no organisms of the coli group should be present in the tenth of a cubic centimetre.

There is an aspect, however, of the milk question which I particularly want to emphasise, and it is this: The quality of cow's milk depends largely on the food supplied to the animals. Even cows from our fine English meadows deteriorate rapidly when transferred to the tropics where dried food consists of straw and hay rapidly ripened, dried to a cinder under a hot sun, and lacking the "sappiness" so essential for milch cows. The native cow is turned out to find its living on burnt and dried patches.

Chemical and bacteriological standards may be set down as I have tried to do above, but no laboratory report can accurately indicate the essential "goodness" of a milk sample.

Milk is like no other food but raw eggs. It is the only product of a living animal used by man. All other animal products are taken from the animal after it has been killed. Milk, therefore, being an animal secretion varies with the breed, food, water supply, and even the temper of the animal. Milk secreted in the enervating climate of the tropics must be entirely different from that secreted in England or any white man's country. The average European or better class merchant keeps his own cows, and I have often been consulted by an anxious mother when the milk disagreed with her infant or when older children were not thriving. "We have our own cow; so our milk must be all right," she would say, having failed to realise the effect of the enervating climate on the animal.

The difference between the milk of Indian and imported cattle is very striking, and it is within the experience of every tropical practitioner to have seen a child who was going from bad to worse when being fed on native cow's milk, begin to thrive immediately when put on milk from an Australian cow. Even in the Argentine, which is the most favoured place for cattle breeding next to England, the farmers have to import fresh blood from England at frequent intervals. Long experience has shown that the difficulty of rearing cattle in the tropics cannot be overcome. The cost of living and of feeding products for animals is just as acute a problem in hot countries as it is at home. "The Man in the Street" has exag

gerated notions of cheap living in the tropics. It is rarely known that milk is sold at the same price in Bombay as in London. Before the war it was actually dearer, and it is doubtful now if high grade milk can be obtained as cheaply in Calcutta as in Chester.

Pure milk produced under the best conditions and kept clean until its consumption is the ideal to be aimed at everywhere, but in view of the foregoing it seems well-nigh unattainable in the tropics at present. *It is little to be wondered at that physicians and sanitarians have turned from the filthy white sewage nicknamed "milk" to the attractive sterile milk powders which have recently been put on the market.* My attention was specially drawn to these products when in charge of a District Military laboratory, and during 1910 I carried out a series of analyses and experiments on behalf of the Government of India. My report strongly advocated the adoption of dried milk for military purposes, and I formed so favourable an opinion of the product that I have ever since steadfastly advocated its adoption as a substitute for cow's milk for infant feeding (*Blackham's Care of Children, 4th Edition, pp.* 13 *to* 18). The product is especially adapted for tropical use, and I strongly support the view of Dr. Harston, of Hong Kong, who has emphasised the advantages of dried milk over condensed milk in warm countries.

In a paper read before the Birmingham Congress of this Institute last year, I pointed out that, apart from employment as a substitute for fresh milk in the hand-rearing of infants there is a wide field of usefulness for milk powder as a food for healthy adults and invalids.

I need here refer only to five conditions, and that very briefly :—

(1) *Sprue and Chronic Dysentery.*—I have seen this form of milk extremely well tolerated in cases in which ordinary cow's milk entirely disagreed, and have prescribed it with considerable success among the pensioners attending a Tropical Disease Clinic of the Ministry of Pensions.

(2) *Tuberculosis.*—This disease is the real plague of the Tropics. The digestion is often feeble in tropical cases, and I have found that milk powder is more readily digested and more readily taken than fresh milk by both Indians and Europeans.

(3) *Tropical Diarrhœas.*—Milk powders are specially useful in these conditions for two reasons, (1) their fine clot, and (2) the fact that they can be digested in strong concentration. The chief objections to ordinary milk, its bulkiness and its hard curd, are thus surmounted.

(4) *Lactation.*—Every tropical mother should nurse her own child, but owing to loss of appetite it is exceedingly difficult to get women in hot countries to drink fresh milk. They nearly all complain that it gives them indigestion and constipation. Dried milk, as a rule, does neither, and is consequently of the utmost value, as it enables the mother to continue nursing by supplying her with readily absorbed nourishment.

(5) *Typhoid Fever.*—During the discussion on my paper at our Congress last year, the Medical Officer of Health of St. Helens spoke very highly of milk powder diet in typhoid fever, and the product is now very extensively used in the dietary of this disease in India and every part of the tropics.

On the Mediterranean littoral and very many places in and near the tropics, where cow's milk is unobtainable and goat's milk dangerous, dried milk has a very large range of application, and for long voyages, exploring parties and the like it presents many advantages over condensed milk.

Produced and dried under the almost ideal conditions attained by some manufacturers from milk fed on English or Colonial pastures the product possesses the essential "goodness" referred to above. From long and varied experience of its use in war, and in peace, I suggest that milk powder presents the best solution at present available of the manifold difficulties indicated above as associated with "The Milk Problem in Hot Climates."

[BLACKHAM (R. J.). *Journal of Royal Sanitary Institute*, 1922, January.]

Clinical and Case Reports.

The Editor will be glad to receive from members and others contributions to this column of reports of interesting cases

Cæco-Colic Invagination in a Pony.

By J. R. RIDER, M.R.C.V.S., Darlington.

An unbroken pony, aged 4 years, was at pasture with other animals, and found dead on 8th April. Sweat marks were visible on the carcase, but when the ponies were visited on the afternoon of the previous day nothing unusual was noticed.

On opening the abdomen a quantity of blood mixed with fæces escaped, and the cæcum was absent from its usual position. Examination of the large colon showed a rupture of the organ near the cæco-colic valve. Incision of the first part of the colon revealed the totally invaginated cæcum lying in its cavity. The cæcum was intensely congested, but other organs were normal except for symptoms of internal hæmorrhage.

This is the second instance of cæco-colic invagination to come under my observation within six months. The earlier case occurred in a working animal, which exhibited symptoms of acute abdominal pain, terminating in death in a few hours. The lesion was not so extensive in this animal, the apex and about one-half of the body of the cæcum having passed through the cæco-colic opening.

Retained Placenta in a Mare.

By F. B. O. TAYLOR, M.R.C.V.S., Redditch.

I have always told clients that should a mare not "cleanse" within twelve hours, professional aid should be at once obtained, otherwise serious consequences might follow, but considering the time which elapsed in this case with no ill effects, I think it is worth recording.

On the afternoon of Friday, June 16th, I received a wire to go and see a mare which had foaled, but not cleansed. On my arrival I enquired when foaling took place, and much to my astonishment was told at 9 a.m. on the previous Wednesday, but as a portion had come away, the owner thought the remainder would follow. I went into an orchard and found a hackney running about with a full-time foal by a thoroughbred horse with part of the cleansing hanging below the hocks. I now had her taken into a stable and removed the whole of one half without difficulty, but found about nine inches left in the other cornua, the withdrawal of which took a little time ; there was also some nasty chocolate-coloured discharge. I now got all the warm water I could, which was about one gallon of a greenish colour, being told that used in the house solely for drinking purposes had to be got from a distance. I added a little lysol to it, and passed it through a rubber tube into the womb ; the liquid was expelled after a few minutes, and I now inserted two antiseptic pessaries.

I expected the mare's temperature to be somewhat elevated, but found it was only 101·4°. I ordered her to be turned out again, and I would call on the Sunday morning (unless she showed any signs of

ill-health in the meantime), when I should probably have to give her womb a good douching. I, however, got a 'phone message saying she was perfectly all right, and I need not go. The owner wrote three days later to the same effect.

Curious Chloroforming Sequelæ.

By H. D. JONES, M.R.C.V.S., Peckham.

Subject.—An eight years old bay gelding.

History.—He was admitted to infirmary because of lameness in the near fore leg. The animal had been lame several times previously on this limb and lameness was diagnosed as being due to pedal arthritis. Horse had been treated several times for lameness, but none of these efforts had very permanent results, therefore it was decided to perform median neurectomy. Animal was kept without food for about 12 hours, as is usual in my cases, before giving chloroform. He was cast and ℥ijss. of chloroform given, which rendered him completely unconscious; the operation was performed within five minutes.

Symptoms.—Directly the muzzle was removed, he kept opening and closing his mouth, not a lateral movement, but opening it to its full extent, in a very peculiar manner. He got up and walked into a box fairly well, but directly he was free walked into the corner of box, pushed his nose hard against the wall until we thought he would suffocate himself. The horse then started biting the walls, which were marked all over by his teeth. We tried fastening him on to the pillar reins, but he tied himself in such a knot that we had to loosen him. He would also bend his head right round with his nose close to his elbow. These and other peculiar antics lasted for about twelve hours, when the animal was left for the night. The following morning he was apparently normal. I fully expected this case to end by the slaughter of the horse, with, possibly, the finding of a psammoma, and was, therefore, very pleasantly surprised to find him recover. I have enquired into this animal's history and there is no suggestion of any brain trouble previously.

A Fatal Œdematous Infiltration.

By H. D. JONES, M.R.C.V.S., Peckham.

Subject.—A five years' old brown gelding.

History.—Admitted to infirmary on 1st June, 1922; said to be dull. Animal's temperature was found to be normal; he fed well and nothing was found amiss except that he looked depressed. He was placed in a box, temperature was taken daily and found to be normal.

On the 10th inst., the animal started to roar, his throat began to swell very rapidly. The swelling was not at all painful—quite œdematous in character, and could be handled without making the animal cough; his temperature rose to 105°, pulse scarcely perceptible, his extremities were very cold. A tube was inserted, but this did not appear to give any relief, and the animal was dead in a few hours.

Post-mortem.—Straw-coloured fluid around muscles above trachea and larynx, some of the muscle appeared to be gelatinous. A portion of muscle examined twelve hours after death appeared to be very pale in colour.

All other organs quite normal.

The following is a report received from the Wellcome Physiological Research Laboratories:—

A microscopical examination of the blood smear provided by you and of œdamatous fluid from the tissue which you sent revealed the presence of a very large number of coccobacilli only. Subsequent cultural examination confirmed the presence of the organisms, but neither *B. anthracis* nor anærobic organisms were present.

Association Reports.

Lincolnshire and District Veterinary Medical Association.

The summer meeting of the Lincolnshire and District Veterinary Medical Association was held at the Angel Hotel, Peterborough, on Thursday, June 8th.

There were present Messrs. T. Hicks, Sleaford (President) in the chair; T. B. Bindloss, Long Sutton; T. F. Hall, Huntingdon; R. W. Knowles, Wisbech; G. Lockwood, Peterborough; J. H. Poles, Whittlesey; E. Wardrop, Outwell; and W. W. Lang (Hon. Sec.), Brigg.

Letters or messages apologising for their enforced absence were received from Messrs. W. A. Dickinson, Crowland; F. L. Gooch, Stamford; H. Caulton Reeks, Spalding; W. W. Grasley, Daventry; C. W. Townsend, Long Stanton; and J. Conner, Long Sutton.

The SECRETARY announced the resignation from the Association of Mr. H. C. Taylor, of Caistor, who was going to Canada. Mr. Lang added that he much regretted that he was losing a very good neighbour. The resignation was accepted with regret, the PRESIDENT adding that the Association was losing just the sort of man the profession most required. They would all wish him well in his new sphere of work. (Applause.)

A letter was received from the National V.M.A. regarding the forthcoming Conference at Bath, and the meeting appointed the Secretary to act as the delegate from the Lincs Association. On account of the expense involved, and the state of the Association's finances, it was decided to rescind the resolution appointing a delegate to the Sanitary Congress.

The meeting considered the appeal for the Malcolm Memorial Fund, and the President referred to the great services that the deceased had rendered to the profession. On the motion of Mr. BINDLOSS, seconded by Mr. POLES, it was agreed to send a donation of £2 2s. with an expression of regret that they could not afford more.

Mr. W. W. H. Edwards (successor to the late Mr. Rudkin) of Grantham, was, on the motion of Mr. KNOWLES, seconded by Mr. WARDROP, elected a member of the Association.

The PRESIDENT thanked the members of the Association for re-electing him, in his absence, at the

annual meeting, to the position of President. They could be assured that he felt it a very great honour to be asked to hold the post for another year. When he fell short in his duty, he hoped they would accept the will for the deed. He should be only too glad to do all he could for them.

An Adjourned Discussion.

At the last meeting Mr. H. Caulton Reeks read a paper on "A few Notes on Foaling Cases and their Sequelæ," the discussion upon which was adjourned. Although the reader of the paper was not present, the members felt they would like to continue the discussion, and an informal exchange of notes and opinions followed.

The first point raised was the alternative use of pulley and block, and other methods of forcing delivery; Mr. Lockwood and most of the other members advocating the former method, though some said they had never used an implement of any kind. Mr. Wardrop referred to an instrument of his own, which he had produced at the previous summer meeting, with which he said he had never had any difficulty in breech presentations.

Mr. Lockwood raised the point of how long it was advisable to leave the afterbirth; some professional men suggested that it did not matter—there was no need to worry about it.

Mr. Knowles said he read his paper on the subject sixteen years ago and he advocated the theory that there was no need to hurry about it. He had now qualified that opinion, and did not like to leave it more than twelve hours.

Mr. Lang asked if any of the members used formalin to prevent decomposition. He had used it and found it useful in half-ounce doses twice daily. He used it internally and found that it appeared to reduce the danger of infection. This was instead of douching them.

Mr. Wardrop asked if it were not too local in its effect.

Mr. Lang said he administered it internally.

Mr. Knowles: How long had she calved?

Mr. Lang: Ten days before the time. Her temperature was at 102 for two days, and, in five days after she cleansed by herself. (Mr. Lang proceeded to give proportions for mixing the formalin, mugwort and ergot).

Mr. Knowles: You are revolutionising veterinary practice.

Mr. Lang: It is so, but I believe it is the reform we need.

The speaker proceeded to describe several cases he had treated successfully, giving the quantities and times of treatment. Mr. Lang added that in treating wounds with salt and formalin, he never used an antiseptic locally.

Mr. Hicks related the details of a foaling case which ended in the death of a mare, on which, however, it was impossible to conduct a proper examination. Various theories were advanced to explain the matter.

Mr. Lockwood mentioned a similar case. The foal was alive here, but the mare was in great distress and eventually died. On being opened a rupture was found in the uterus.

Mr. Hicks mentioned another recent case, in which the mare showed, two days after the foal was born, septic poisoning of the udder, and there was blood in the milk. He asked for another mare, as he was afraid her milk would kill the foal. This was refused, and she did kill it. The mare's udder felt as though she had a rupture, and there was an enormous swelling. He had hot blankets applied for forty-eight hours, and instructed that the swelling should be dabbed over with vinegar. The mare was normal now, and eating well.

Mr. Poles asked if members had seen a case where the walls of the abdomen had given way. He had seen one. They got the foal away alive, but had to kill the mare.

Several other instances were recorded and discussed, after which the meeting adjourned.

W. W. Lang, *Hon. Sec.*

South Eastern Veterinary Association.

A General Meeting of the Association was held at the Royal Star Hotel, Maidstone, on Thursday, May 25th.

The President, Mr. T. F. Hogben, occupied the Chair, and there were also present: Messrs. G. W. Dunkin, J. B. Buxton (F.), C. Crowhurst, C. Roberts, E. Ebbetts, E. Morgan, C. W. Perrin, O. V. Gunning, J. B. Dier, F. Marks and H. P. Hogben, hon. secretary. Letters and telegrams of regret at inability to attend were received from several members.

The President, in a few introductory remarks, expressed his pleasure at meeting the members again. It was his third year of office and it was absolutely against his wish to continue as president, but in the absence of anyone else he consented to remain, so he felt sure they would not expect anything from him in the nature of a presidential speech.

He hoped that in future as many members as possible would endeavour to attend their meetings and so promote good feeling amongst them, as well as discuss the subjects that would arise from time to time.

An abstract of the minutes of the last meeting was then read and passed.

Sanitary Congress (Bournemouth, July 24th to 29th).—Mr. J. B. Buxton was appointed and kindly consented to represent the Association.

National Veterinary Association (Annual Meeting).—Mr. Buxton referred to the importance of this meeting, and hoped that members of the Association would make an effort to be present.

Veterinary Inspectors of the Kent County Council (Reduced Travelling Allowances).—The following graduated reduced scale of travelling allowances for Veterinary Inspectors of the Kent County Council was then discussed:—

Travelling Allowances—

(*a*) For travelling by railway 3rd class fare.

(*b*) For travelling otherwise than by railway*

(i.) By motor car ... 7½d. per mile.

(ii.) By motor cycle and side car ...	4d.	per mile.
(iii.) By motor cycle	3d.	,, ,,
(iv.) By pedal bicycle	2d.	per mile and cost of carriage of bicycle by train where necessary.
(v.) By omnibus ...	Actual fare.	

*No allowance will be made for travelling expenses when the place visited is within two miles of the residence or place of business of the inspector.

The scale was very adversely commented upon, and in view of the fact that the scale was not due to, or on the initiative of, the County Authorities, but was a Treasury Order, it was felt that the matter could be best dealt with by the National Veterinary Medical Association, and the following resolution, on the motion of the President, was unanimously carried :—

" That in the opinion of this meeting the proposed revised scale of travelling allowances issued to the Veterinary Inspectors of the Kent County Council (as operative from 1st May, 1922) is entirely unsatisfactory, and this division requests the Council of the National Veterinary Medical Association to make such representation to the proper authority as to ensure the withdrawal of such scale, which is both financially inadequate and an indignity to the profession.

" In the opinion of this division the veterinary inspectors are entitled to a uniform travelling allowance of not less than ninepence per mile distance travelled (whatever mode of conveyance be used), whether such distance be less than two miles from the residence of the veterinary inspector or not, and not less than second class railway fare when travelling in that way."

The Secretary was further instructed to forward copies of the resolution to all the veterinary inspectors of the County for approval.

Post-Mortem Cases.

Major Dunkin said " I regret that I have not a specimen of this particular case here to show you. I have had photographs taken and these, in my hurry, I have unfortunately left at home.

" The case was one of a retriever bitch about two years old, and which had been since weaning, housekept and house-fed. I was first consulted about her two months previous to her death, and then she was showing symptoms of anæmia, associated with loss of condition and a certain pot-bellied appearance. Treatment failed to relieve her and in fact she continued to lose condition and the pot-bellied appearance increased. On auscultation of the abdomen the presence of fluid was suspected, and aspiration was suggested to the owner. This was not agreed to at the time, the owner wishing to continue treatment of a medicinal nature for a few days longer. The bitch got so weak that she could hardly walk across the room, and I was at last allowed to operate.

" The result of aspiration was that a fluid which appeared to be almost entirely blood was obtained, and although fresh sites were attempted, the same result was obtained.

" I formed the opinion that a cure was impossible, and at the same time discovered a much enlarged condition of the liver, which appeared to take up a much larger space in the abdomen than normal. I suggested her immediate destruction, which was agreed to.

" On *post-mortem* the liver was found to be the seat of numerous growths of varying sizes, from an apple to a pea, and so numerous that there hardly appeared to be a normal piece of liver anywhere.

" Smaller and similar growths were also present on the mesentery, these being about the size of a hat-pin head.

" The consistency of all these was the same, and the contents were mostly blood, except in the larger ones, in which there appeared to be some tissue growth taking place. Mr. Buxton kindly examined these for me, and his opinion is that they were myxo-sarcomata. I regret intensely that I have forgotten the photographs, for they show the condition well, and much more clearly than I have described them."

The President exhibited a large tumour of melanotic structure which he had removed under chloroform from the anal and buttock region of an aged horse at the request of a client. The operation was quite successful, but the animal succumbed subsequently, which he attributed to loss of blood and shock. He operated by special request of the owner.

The President then requested Major Dunkin to read his paper—" A short note on the Toxicity of Sea Water to Bovines."

[Major Dunkin's paper receives separate publication.—Ed.]

The usual votes of thanks were passed and acknowledged.

It was decided to hold the next meeting of the association in September, at Canterbury.

Hugh P. Hogben,
Hon. Secretary.

Notes and News.

The Editor will be glad to receive items of professional interest for these columns.

Royal (Dick) Veterinary College.

A deputation from the Royal (Dick) Veterinary College, Edinburgh, waited upon the Secretary for Scotland in his office, Parliament Square, Edinburgh, on June 22nd, when the financial position of the College was the subject of discussion. Mr. Munro was accompanied by Dr. George Macdonald, of the Scottish Education Department, and Mr. James Wood, of the Board of Agriculture for Scotland.

Sir John Rankine, K.C., chairman of the Board of Governors, and Councillor Garden put the case for the College, and a reply in sympathy with the Board of Governors was made by the Secretary for Scotland.

The proceedings were held in private.—*The Scotsman.*

Royal Sanitary Institute Congress.

The 33rd Congress and Health Exhibition of the Royal Sanitary Institute, will be held at Bournemouth, from July 24th to 29th, under the Presidency of Major-General The Right Hon. J. E. B. Seely, C.B., C.M.G., P.C., D.S.O., M.P., Lord Lieutenant of Hampshire.

Many representatives of Public Health bodies are expected, including the Right Hon. The Lord Mayor of London and the Lady Mayoress, who are taking an active part in the meeting, and the following Government Departments and Dominion and Foreign Governments and Municipalities have also appointed Delegates to the Congress :—

Government Departments.

Board of Control, England.
Ministry of Pensions.
H.M. Office of Works.
War Office.
Scottish Board of Health.

Foreign and Dominion Governments and Municipalities.

Calcutta.
Ceylon Medical College.
Province of Quebec.
Province of Ontario.
Newfoundland.
Western Australia.
South Australia.
Adelaide, South Australia.
New South Wales.
Victoria, Australia.
Hobart, Tasmania.
New Zealand.
Christchurch, New Zealand.
Durban, South Africa.
Kimberley, South Africa.
Port Elizabeth, South Africa.
The West Indian Centre of the Royal Sanitary Institute.
Hong Kong.
Shanghai.
Singapore.
Roumania.
Denmark.
Greece.

Disease Among Horses.

HEAVY MORTALITY IN FORFAR.

Once more Forfarshire is experiencing that high mortality amongst its draught horses which appears to be becoming a seasonal feature. The present outbreak is more than usually severe, and it is estimated that within the past fortnight something like seventy horses have been affected with illness, which in most cases is believed to be grass disease. How high the mortality has been is evident from the fact that one Forfarshire knackery is stated to have received forty horse carcases from that county and the Mearns within the period mentioned.

Nor has the trouble been confined to un-inoculated horses, since some of those which underwent the serum treatment have been attacked, and have not always recovered. Since the majority of the horses attacked are young, valuable animals, the loss to the owners is very heavy, and the animals will in most cases have to be replaced before harvest comes along.

In the Forfar district the disease has assumed alarming proportions. The first cases came to notice about a month ago, but these were regarded as isolated ones. The disease has, however, spread with great rapidity. The Carmyllie district is reported to be very badly affected.

Interviewed, Mr. T. M. Inglis, V.S., Forfar, said the outbreak was the worst he had known in the district for very many years. There had been a large number of deaths amongst the animals affected. Fully thirty animals had died recently from the sickness. Questioned as to the effect of the serum recommended as a preventive of grass disease, Mr. Inglis said they had inoculated over 600 animals in his district, which is a very wide one. A few of these animals had been genuinely affected by the sickness, but, on the whole, the proportions only ran to very little over 1 per cent. of the 600. Amongst inoculated horses, the disease had in most cases taken a very much modified form. A few of the animals which had died as the result of the sickness had been inoculated, but the proportion was very small.—*Aberdeen Journal*, June 21st, 1922.

London Firm's Show Successes.

The following list of their successes recently secured by the horses of Messrs. Mann, Crossman and Paulin, Ltd., the well-known London brewers, is of interest in connection with the maintainance of the Shire on the streets of the Metropolis. The selection of the firm's animals is in the hands of Mr. W. S. King, M.R.C.V.S.

June 5th—**London Cart Horse Parade, Regents Park.**
Seven entries—Seven firsts and four Shire Horse Society's Medals.

June 7th.—**Surbiton Horse and Cattle Show.**
For best mare or gelding shown in hand.—First with brown gelding **Melton,** 4 years, by Shavington Cæsar (33531), dam Model by Wharton Dray King (30002). For best heavy draught mare or gelding to be shown in harness, open to the United Kingdom.—First and 25 guinea Cup with bay gelding **Doncaster,** 10 years; second and reserve for cup with bay gelding, **Hero,** 6 years, by Whitney Forest King (31071), by Dunmore Prince III. (25162).

June 8th—**Richmond Royal Horse Show.**
For best heavy draught horse.–Second with **Hero,** 6 years.

June 21st—**International Horse Show, Olympia.**
First with bay gelding **Doncaster,** 10 years; first with bay gelding **Hero,** 6 years.

June 24th—First with a pair of grey geldings 8 and 9 years old respectively, Lincoln and Common, for best trade pair turnout.

We are pleased to hear that all arrangements have been made for the provision of subjects, apparatus, etc., for the demonstrations at the Annual Meeting.

It is highly satisfactory and is a tribute to the energy of our colleagues in the west.

MARRIAGE.

SHEEDY—HINSLEY.—On June 22nd, 1922, at the Church of Our Lady of Dolours, Effingham, Surrey, by Rev. Father W. J. Flynn, O.B.E., C.F., assisted by Rev. Father P. Hemans, Captain Frederic John Sheedy, M.B.E., B.Sc., M.R.C.V.S., Tanganyika Territory, eldest son of Thomas Sheedy, Fairview, Cork, to Hilda, second daughter of the late Charles J. Hinsley, Ridgway Gardens, Wimbledon, and niece of the Right Rev. Monsignor A. Hinsley, D.D., Rector of the English College, Rome.

Capt. Sheedy is Deputy Chief Veterinary Officer to Lieut.-Col. F. J. McCall, M.C., C.V.O., at Dar-es-Salaam, Tanganyika Territory. Both officers have been closely associated since the beginning of the Great War, during part of which Col. McCall was A.D.V.S., East African Force, when Capt. Sheedy was also his deputy.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Clean Milk.

Sir,—Now that the trouble in the printing trade is over we can go on with the good, bad or indifferent work. The interest of the "Correspondence" section is such that many men turn to it first of all on receiving their periodicals.

I should not like to accept the responsibility and allocate the blame in declaring what impurity is most frequent in milk. The strict spherist generally sticks to his domain. The bacteriologist and landlord will probably say bacterin; the enthusiast for skin care have dust and skin debris;

the owner of a clarifier (which does not lie), cow dung; the man interested in milk cans and utensils, rusty and deficient examples; the commercial traveller and itinerant observer, exposed milk. If one grants, as Mr. W. S. Stevens, M.R.C.V.S., states, that the source of clean milk is the clean cow, then surely one ought to go back a bit further and ask, What is the source of the clean cow? Human intelligence, effort and perseverance being what they are, I believe that a properly constructed cow-house is almost as big a factor in cow cleanliness and resultant clean milk as the personal equation. The intelligent cow attendant is apt to express himself in unequivocal terms and exclaim, How can one possibly keep cows clean in this badly planned, disgustingly fitted, tumble-down old show? Eventually he despairs of ever doing it and gives up trying. If "the greatest offender in the condition of dirty milk is the dirty milk container," why does the clarifier slime consist chiefly of cow dung?

The proper purity of milk is bound up with many states and operations from its exit from the cow's teat to its insertion into the human mouth, and there are numerous factors that need consideration if it is to be clean.—Yours truly, G. MAYALL.

88 St. George's Road, Bolton.

Veterinary Inspectors' Fees in Suffolk.

Sir,—As Chairman of the Suffolk Veterinary Inspectors' Association, I venture to send you two scales of fees and allowances payable to the Veterinary Inspectors of the Suffolk County Council.

The "existing scale" was drawn up in 1913; during the war 25 per cent. was added to the accounts.

In 1921, the Executive Committee of the local authority withdrew the 25 per cent. addition.

After several interviews the committee has sanctioned (as from 1st April, 1922) the new scale.—Yours faithfully, HORACE L. ROBERTS, F.R.C.V.S.

New Scale.

EAST AND WEST SUFFOLK.

Scale of Fees and Allowances to Veterinary Inspectors as from 1st April, 1922.

	£	s.	d.
Ordinary Visits (excluding Foot-and-Mouth Disease)	0	15	0
Inspection of Markets and Sales (if appointed)	0	15	0
Post-mortem Examinations	1	1	0
Microscopical Examinations—Mange and Sheep Scab	0	7	6
Ditto—Anthrax and Glanders	0	10	6
Mallein Test (Glanders)—First Horse	1	1	0
Each other animal tested at same time ...	0	10	6
Registration of Temperatures—Each Visit	0	5	0
Foot and Mouth Disease:—			
Inspections where number of animals does not exceed 10	0	15	0
Ditto, exceeds 10, but does not exceed 25 animals	1	1	0
Ditto, exceeds 25 animals	2	2	0
Mileage—Allowance per mile actually travelled	0	0	6
Cost of Telegrams and Telephones necessarily incurred			

A. TOWNSHEND COBBOLD,
Clerk of the Local Authority.

County Hall, Ipswich, 13th June, 1922.

Existing Scale, July 1913.

Ordinary Visits	0	10	0
Inspection of Markets and Sales (if appointed)	0	10	6
Post-mortem Examination (other than in Tuberculosis)	0	10	6
All Microscopical Examinations	0	5	0
Mallein Test (Glanders) first horse	1	1	0
Second and third (each)	0	10	6
Tuberculosis:—			
First Visit	0	15	0
Post-mortem...	0	15	0
All Microscopical Examinations...	0	5	0
Tuberculin test up to 8 animals	2	0	0
Each additional animal, 5s. to a maximum of			£5
Mileage—Allowance per mile actually travelled	0	0	6
Cost of Telegrams allowed.			

Ministerial Information Needed.

Sir,—As this paper is only read by veterinary surgeons, I presume one can write with a little freedom in regard to "putting one's house in order."

My first is a suggestion to the Ministry of Agriculture and Fisheries, and my second one to the Army Remount Department.

Is it not possible for the Ministry to write the local veterinary practitioners in the different areas of foot-and-mouth disease, telling them *first hand* where the outbreak is, its nature, and if possible its origin? At the present moment three-quarters of my practice is in a "tied up" area, because of an outbreak at Rochdale (Lancs). The first person to tell me was a local farmer who had been previously informed by a police officer.

I think it is most annoying for a veterinary surgeon to be asked about these outbreaks and for him to have no first-hand information concerning the matter.

It is not very long ago that we had an outbreak in the local abattoirs here and I (the only local veterinary practitioner) was three days before I heard of it. Moreover, if we had more information about these outbreaks we could be earlier on one's guard and especially if the affected animals were actually in one area or had come from one area. Again, the rumours that circulate—probably because there is no one in authority who can contradict them—are sometimes appalling; the following are some of them concerning the Rochdale outbreak:—

I.—The farmer has had it before.

II.—It has come from Irish cattle he had just bought.

III.—That although he knew of it, he actually sent some cattle to Salford market and then reported it on the following day.

Whether such tales are true or not I do not know, and, in consequence, cannot contradict them, but nevertheless such reports as No. 1 and No. 2 are not a credit to the profession if they are so.

We receive a certain number of circulars from the Ministry, and also from the County Authorities, but in my opinion, Mr. Editor, we do not receive enough at such an important time as this when, probably, we can be of great service to the country if only warned in time and given full particulars of the outbreaks.

And now to the Remount Department of the Government. In my practice I have had seven or eight Government Boarded-out Army horses under my professional care and the other week one of the owners came to me and said he had received a letter saying that the scheme is now ended and they must either buy their horses or return them.

Up to the time of writing I have had no information from the Remount Department saying that this is so or not, or that my contract is now ended, which, I presume, must be the case if the scheme has been abandoned.

I wrote the local Remount Officer only a few weeks ago, on behalf of two clients who desired a horse each, and he replied, saying that he did not think any more animals were being issued, but not a word about the scheme having been given up.

Naturally one tries to keep oneself up-to-date in things of this sort, but it is most difficult when one has solely to rely on second-hand information and newspapers.

Concerning the Ministry, as each town usually only possesses one veterinary practitioner, it is not a big task to keep him informed concerning these local outbreaks, and by so doing perhaps he could be of more use to them, or he could at least contradict any false rumours which are so apt to get about during these anxious times.—Yours faithfully, G. C. LANCASTER.

35 Church Street, Burnley, June 22nd, 1922.

Army Veterinary Service.

LONDON GAZETTE. WAR OFFICE. REGULAR ARMY RESERVE OF OFFICERS.

June 30th.—Major R. H. C. Higgins, M.B.E., retired pay, to be Major (May 27th), with seniority, November 5th, 1919.

Appointments Required.

Locum Tenens,
H. J. O'Neill, M.R.C.V.S.,
33 King's Place,
Buckhurst Hill,
Essex

FINAL YEAR STUDENT up in July, experienced in town and country practice, desires post as Assistant or Locum after 15th July. Terms arranged privately. Reply 538 V.R., 12 Buckingham Palace Road, S.W.1.

VETERINARY SURGEON, experienced, will act as Manager or Assistant. Board and £3 3s. 0d. per week. Write Box 1307 Willings, 30 King Street, W.C.2.

M.R.C.V.S., disengaged, practical and reliable, experienced town and country, desires situation as Assistant. South of Midlands preferred. Reply 230 V.R., 12 Buckingham Palace Road, S.W.1.

WANTED, by experienced practitioner, position as Locum or Assistant, with view to partnership or succession. Reply 558 V.R., 12 Buckingham Palace Road, S.W.1.

"C" STUDENT (English), Veterinary Surgeon's son, desires to see good mixed practice during coming vacation. Married; live out. Willing pay own keep in return for experience. Keen, steady. Reply 557 V.R., 12 Buckingham Palace Road, S.W.1.

M.R.C.V.S., age 28, resident in London, would act as Locum or Assistant during the day for unlimited time, or would entertain partnership. Excellent references and well up in town practice. "Vet." 25 Alderbrook Road, Clapham Common, London, S.W.

Practice Wanted.

WANTED small Country or Seaside Practice, or nucleus of same, or premium will be paid for information (if acted on) of good opening. Reply 561 V.R., 12 Buckingham Palace Road, S.W.1.

Practices for Sale, etc.

COUNTRY Practice, South-Western County; returns £300 to £400 a year, plenty of scope. Small house. Rent £30. Premium £250, or near offer. Apply Peacock and Hadley, Vet. Dept., 19 Craven Street, Strand, W.C.2.

IN FLOURISHING Market Town in Surrey, old-established veterinary premises for sale. Compact house, nine rooms and bath room, garage, stabling for five horses, rooms over stables, kennels. Leasehold 23 years. Price £800. Reply 559 V.R., 12 Buckingham Palace Road, S.W.1.

THE ORIGINAL Veterinary Transfer and Partnership Agency established by C. H. Huish, 1874. This old-established firm undertakes the sale of practices, the introduction of partners, valuations, and the supply of trustworthy Locum Tenens and Assistants. No charge made to purchasers. Wanted, a sound general country practice, returning from £1,250 to £1,500 per annum. Client has ample capital at command. C. H. Huish and Co., 12 Red Lion Square, W.C.1.

PRACTITIONERS wishing to dispose of their practices or wanting partners are invited to apply to Peacock and Hadley, Veterinary Transfer Agents, 19 Craven Street, Strand, W.C., who always have several would-be purchasers of practices or partnerships on their books. No charge incurred unless sale effected. Locum Tenens and Assistants supplied at short notice.

Miscellaneous.

HARRY P. STANDLEY, M.R.C.V.S., Orford Place, Norwich, Specialist in Castration of Rig and Ruptured Horses, is prepared to operate on horses for members of the profession. Insurance effected before operation is desired.

WM. COLLINSON, M.R.C.V.S., South Anston, Sheffield, is prepared to operate on, or supply solution, with full instructions to members of the profession, for injection in Bog Spavin, Thoropin, Capped Hock, or other Bursal enlargements. Also for stifle lameness in young animals.

MR. WILLIAM SCOTT, F.R.C.V.S., the Laboratory, Friarn House, Bridgwater, undertakes the preparation of Autogenous Vaccines for the profession. Sterilised tubes for collecting materials sent with instructions on application.

CAPT. L. C. MAGUIRE, F.R.C.V.S., Barrow Elm House, Fairford, Glos., specialist in diseases of Genital Organs of Animals, is prepared to advise and treat animals for members of the profession.

MR. G. RINGER, Veterinary Infirmary, Leamington Spa, will be pleased to operate on Rigs and Roarers for members of the profession.

ONE-TWELFTH Inch Oil Immersion lens, made by Swift. Practically new and guaranteed in perfect condition. Price £5. Reply 553 V.R., 12 Buckingham Palace Road, S.W.1.

Royal (Dick) Veterinary College, Edinburgh.

Principal—O. CHARNOCK BRADLEY, M.D., D.Sc., M.R.C.V.S.

Ninety-ninth Session.

COURSES OF INSTRUCTION qualify for M.R.C.V.S. and B.Sc., Edinburgh College. Calendar, with full particulars of Examinations, Bursaries, etc., may be obtained from F. P. MILLIGAN, W.S., Secretary.

Veterinary Diagnosis.

IN response to numerous requests from practitioners, arrangements have been made for veterinary diagnosis to be carried out by the Veterinary Department of the Wellcome Physiological Research Laboratories.

All enquiries should be addressed to Wellcome Physiological Research Laboratories, Langley Court, Beckenham, Kent.

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